Salmon, and the linked aquatic and human systems in Bristol Bay

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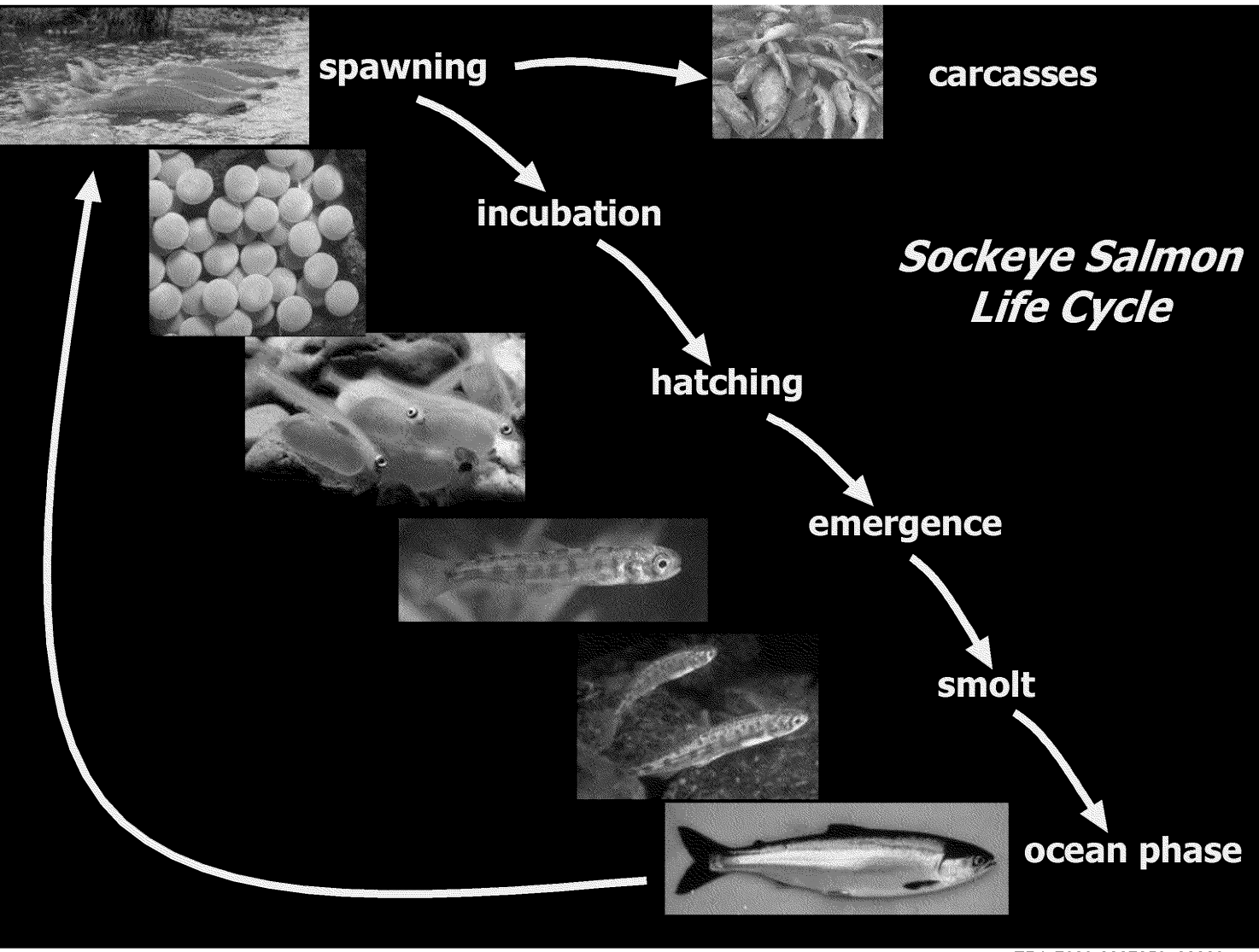
Goals of this presentation:

- Outline the salmon life cycle
- Describe the magnitude of salmon runs in Bristol Bay, especially Iliamna Lake
- Reveal the critical role of salmon in the Bristol Bay ecosystem
- Explain why hard rock mining would lead to unacceptable adverse effects

The threat is specific, so action can be taken and great benefits achieved.



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Bristol Bay's sustainable fishing

We frequently hear that *"fisheries inevitably ruin the resource that they rely on"*. Perhaps the best counter-example is the sockeye salmon fishery in Bristol Bay.

With sound management and good habitat, salmon are caught in a sustainable manner, supporting commercial and subsistence fisheries, and maintaining the ecosystem.

With protection, this will go on indefinitely.

The numbers of wild salmon in Bristol Bay, especially Iliamna Lake, are truly exceptional.

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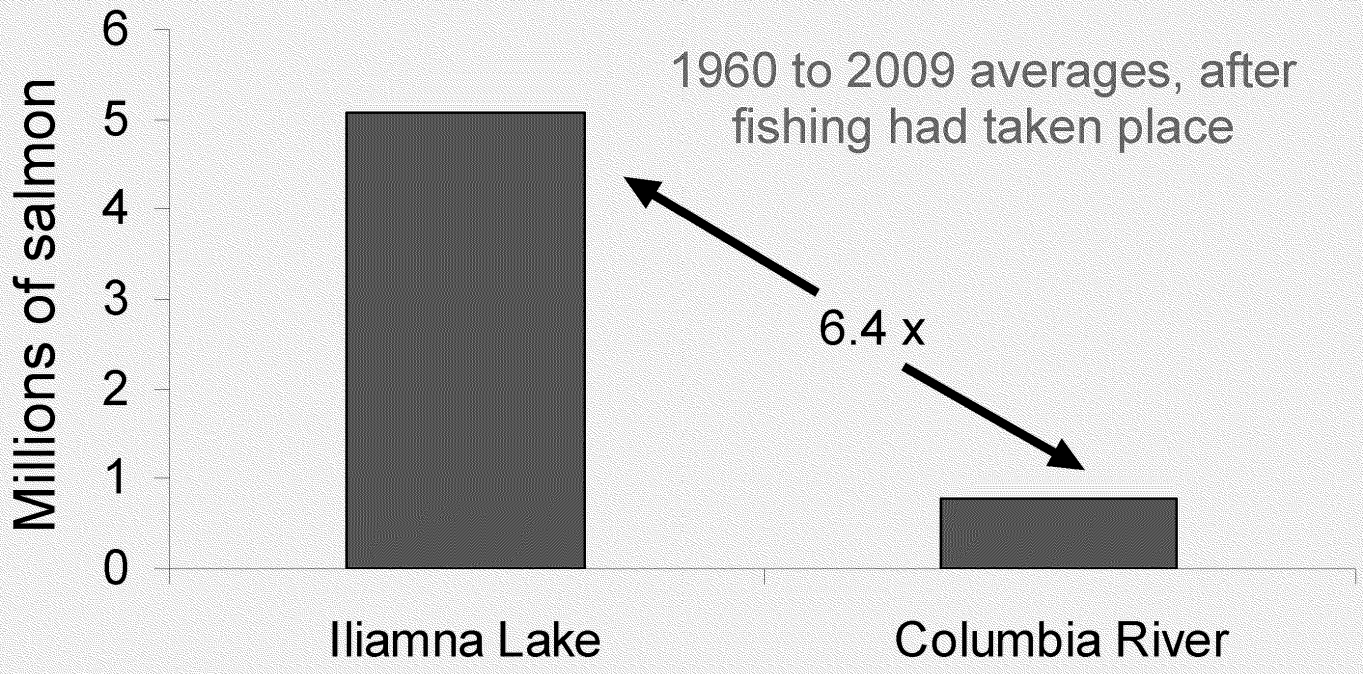
The sockeye salmon runs to Iliamna Lake and its tributaries vastly outnumber those of all salmon species combined, including hatchery production, in the entire Columbia River basin above Bonneville Dam.



1965 run of sockeye salmon to Iliamna Lake and its tributaries.

47.6 million

6.3 x

7.5 million

Estimate of all salmon combined, at the peak of the Columbia River's natural production.

The University of Washington has worked in Bristol Bay since the late 1940s to:

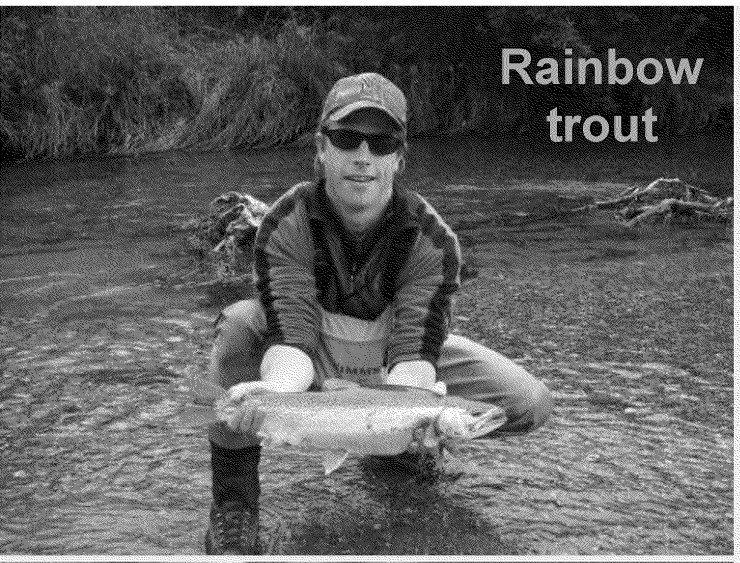
1) Understand the physical and biological processes controlling salmon and other parts of the ecosystems
2) Provide this information for the sustainability of fisheries, the human communities, and the ecosystems

What have we learned about sockeye salmon and their ecosystems in Bristol Bay?

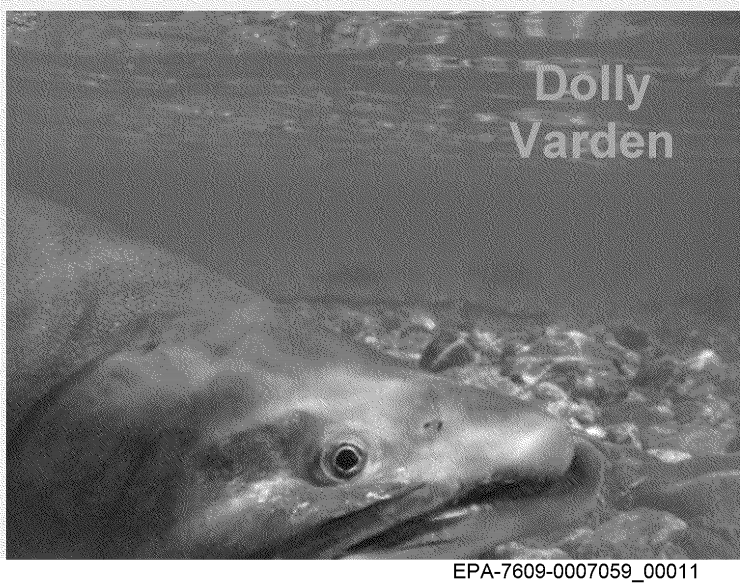
The total Bristol Bay sockeye salmon run is more stable and more productive than any of the districts, lakes, and individual populations within it. Components of the system that were once weak are now strong, and vice versa.

This is a "portfolio effect". By analogy, a diverse portfolio protects the investor against ups and downs in sectors of the economy, increasing long-term yield.

The implication: Protection of the components is crucial for the productivity of the whole.



Our work also reveals the close connections between salmon, other species, and the ecosystem as a whole.



Bears, foxes, seals, eagles, northern pike, and trees: all depend on healthy salmon runs, clean water, and intact habitat.

Why are people so concerned about large-scale mining activity in these areas?

- Absolutely certain, planned effects
- Virtually certain but unplanned effects
- Possible catastrophic effects

Certain, direct, planned changes in the basin:

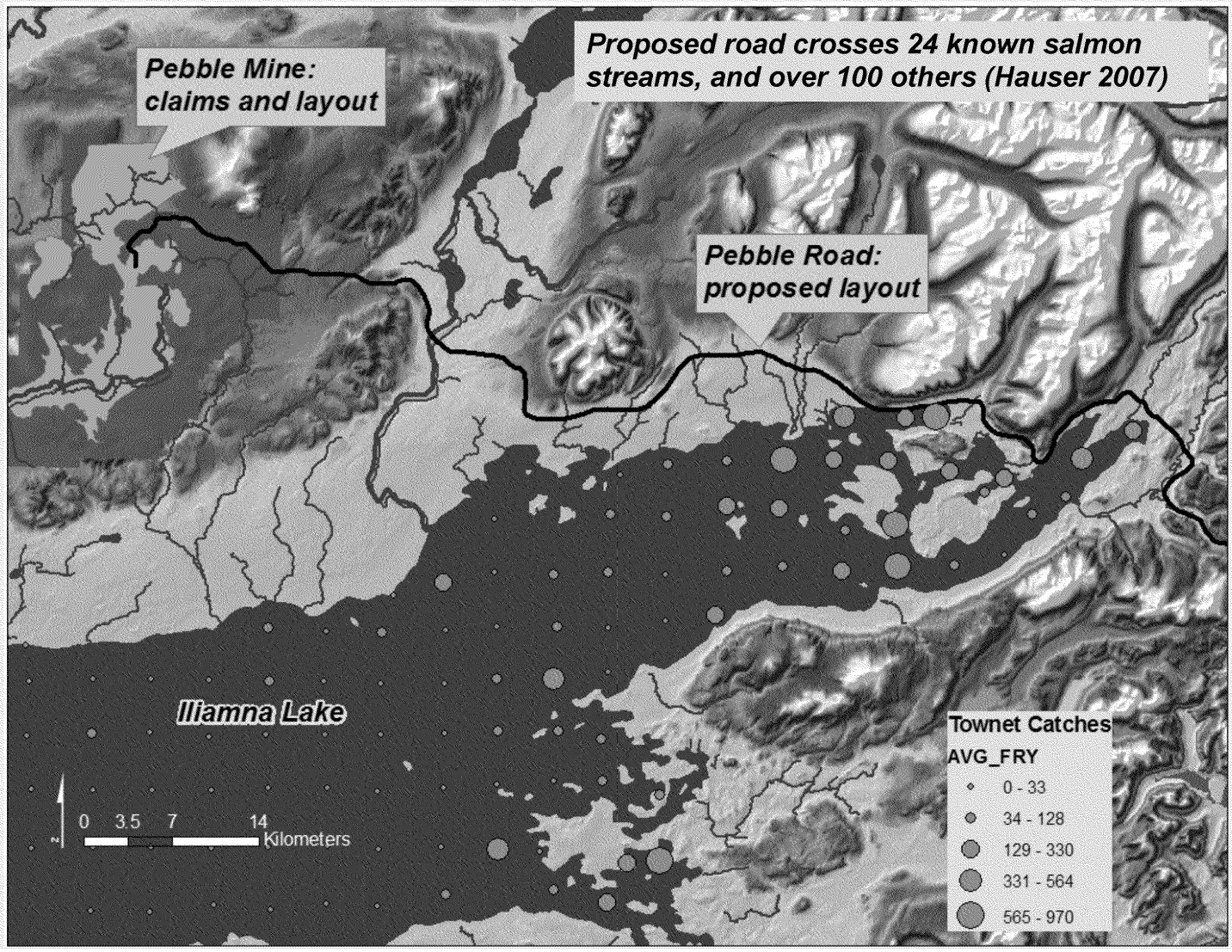
- **Appropriation of stream and groundwater over a large area, spanning the Kvichak and Nushagak basins**
- **Roads, heavily used by very large vehicles, crossing many rivers and streams**
- **Great increase in transient human population**
- **Extensive requirements for power, requiring off-site generation and transmission**
- **An enormous hole in the ground, far below lake level**
- **An equally enormous reservoir of toxic material, towering some 700 feet above the land**
- **Disposal of "waste" rock and other material**

Virtually certain, direct but unplanned effects:

- **Unpaved roads will fail**
- **Culverts will erode and become impassible**
- **Chemicals will spill, permitted limits will be exceeded**
- **Humans will make mistakes and cut corners**
- **Fines will be just part of the cost of doing business**

If the project is goes forward, no problem would be sufficient to force its cancellation.

Consider, for example, the road system…



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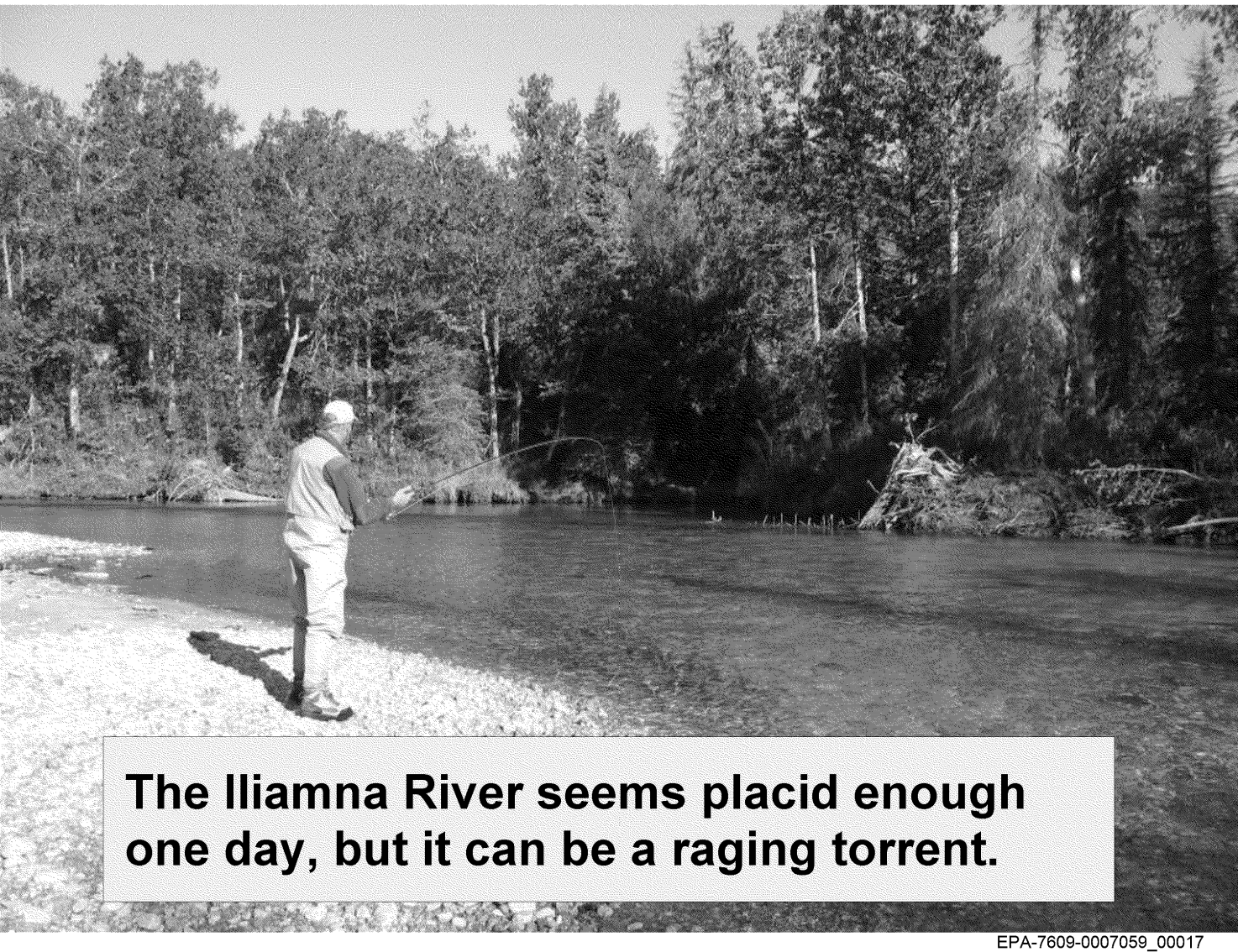
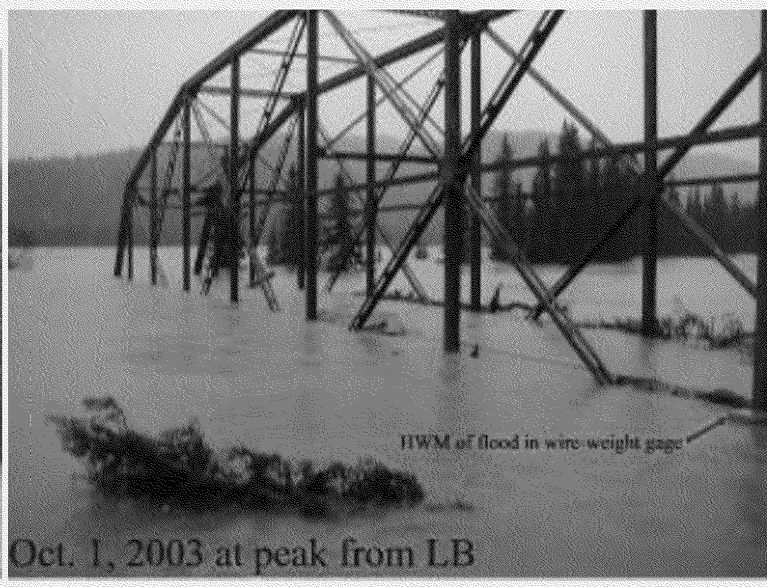


The Iliamna River seems placid enough one day, but it can be a raging torrent.

Iliamna River bridge, October 2003

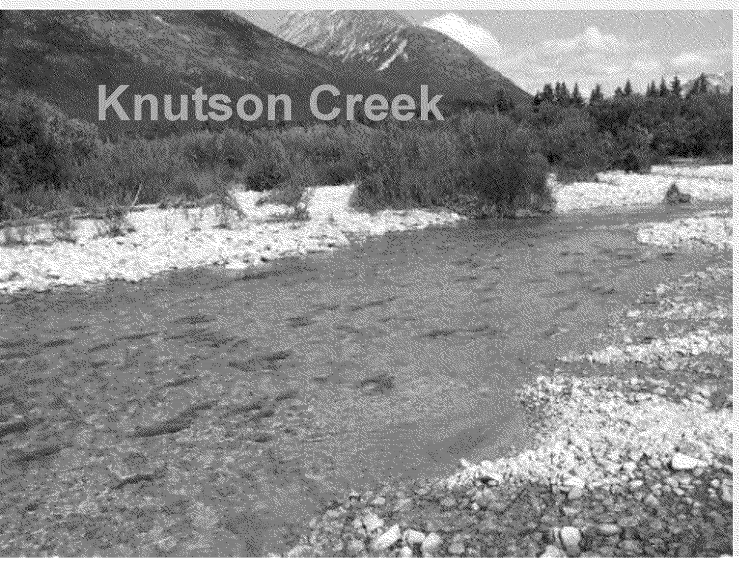


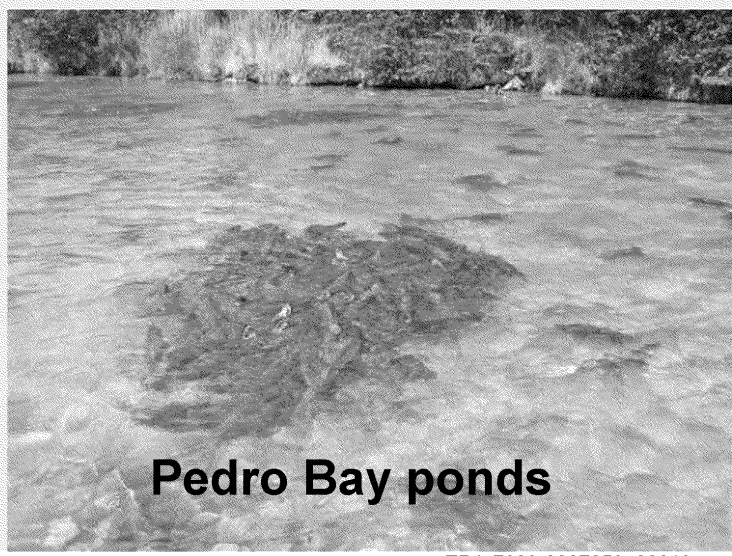
Heavy trucks would drive on unpaved roads, crossing many rivers including the Iliamna, back and forth to Cook Inlet.

Ray Williams, photos

Silt from roads smothers embryos, water diversion reduces flows, culverts block passage, and cumulative effects make it difficult to isolate and fix the problems.

Three of the streams along the proposed road system





Do not be mislead by specious arguments

"There are plenty of salmon elsewhere"

"Engineers can prevent any problems"

"Hatcheries can replace any losses"

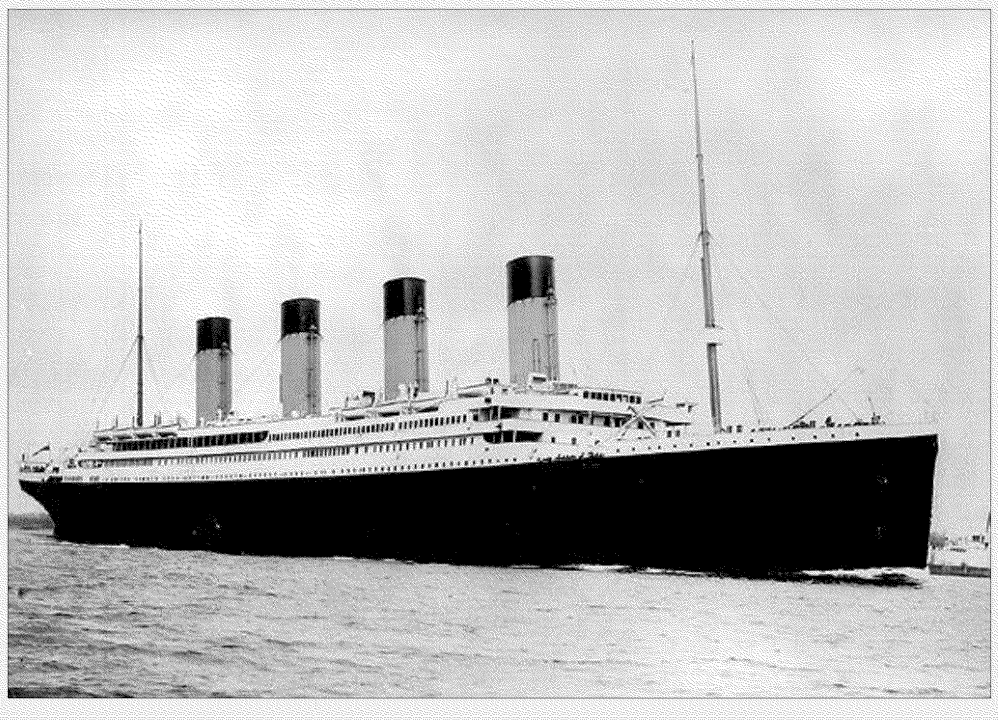
Operations, regardless of details, will inevitably have a severe effect in streams near the site, and along the road system. Less certain but much more severe effects would result from any of the "catastrophe" scenarios.

Catastrophic effects could occur:

- **A sudden failure of the reservoir of toxin from engineering or tectonic processes**
- **Seepage of toxin from the reservoir**
- **Large unanticipated changes in groundwater**

If any such event took place, no amount of money would be sufficient to undo the harm

The Titanic, Chernobyl, the *Exxon Valdez*, and most recently the "spill" of oil in the Gulf of Mexico provide continual reminders of our hubris and inability to conceive that things can go wrong.



We have a long history of degrading our ecosystems and then trying, with great cost and little success, to restore them.

We know how this is going to play out. Why do we have to go down this road again?

There can be no doubt that with this project:

"… the discharge of such materials into such area will have an unacceptable adverse effect on municipal water supplies, shellfish beds and fishery areas (including spawning and breeding areas), wildlife, or recreational areas"

Congress and other mainstream politicians call for *salmon strongholds* as more cost-effective and sensible than the "degrade first and try to rehabilitate later" approach.

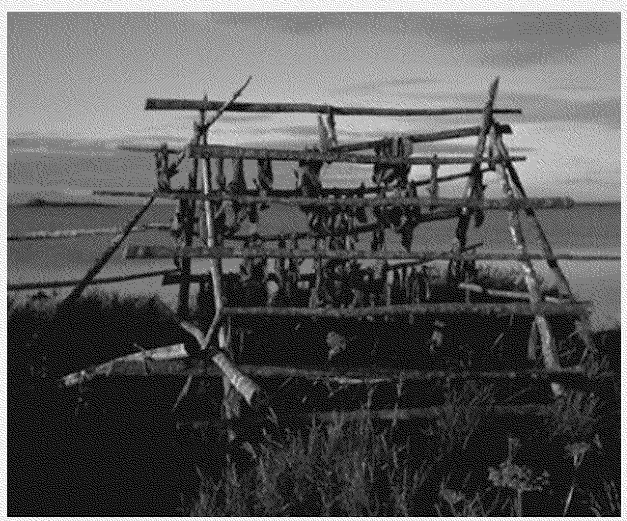
"…by protecting the best remaining salmon ecosystems throughout their range, wild salmon can not only survive, but thrive, for generations to come."

William Ruckelshaus, former head of the EPA, and John Kitzhaber, former governor of Oregon

Op-Ed piece, Seattle Times, June 13, 2008

Iliamna Lake's ecosystem is the ultimate salmon stronghold, supporting viable, healthy human communities including traditional ways of life.

Even under the most optimistic scenario the damage is certain and severe, only the magnitude is open for debate.



Photographer unknown

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- If this ecosystem does not merit protection, what does?
- If this mine does not constitute a threat, what would?
- If we don't draw a line here, there is none to be drawn.

Thank you for your consideration